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# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re application of: | Stephen J. Ames et al. : | Confirmation No. 5002 |
| Group Art Unit: | 2633 | IBM Corporation |
| Examiner: | N. M. Curs | Intellectual Property Law |
| Serial No.: | 09/893,222 | Dept. 917, Bldg. 006-1 |
| Filed: | June 27, 2001 : | 3605 Highway 52 North |
| Title: | DETECTION OF DATA TRANSMISSION RATES USING PASSING FREQUENCY-SELECTIVE FILTERING : | Rochester, Minnesota 55901 |

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Alexandria, VA 22313-1450
Sir:

## APPEAL BRIEF IN SUPPORT OF APPEAL

## FROM THE PRIMARY EXAMINER TO THE BOARD OF APPEALS

Applicant(s) herewith submit an appeal brief pursuant to a Notice of Appeal filed December 17, 2004, as required by 37 C.F.R. 1.192.

Deposit Account Authorization:

☒ Please charge Deposit Account No. 09-0465 in the amount of $500.00 to cover the fee under 37 CFR 1.17(c) for the filing of the enclosed appeal brief. A duplicate copy of this sheet is enclosed.

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February 28, 2005
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Nancy J. Larson
Nancy J. Larson

Respectfully submitted,

By: Leslie Payne

Leslie J. Payne, Attorney
Attorney Reg. No.: 26,378
IBM Corporation, Dept 917
3605 Highway 52 North
Rochester, MN 55901-7829
Telephone: (507) 253-2555

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## APPEAL BRIEF IN SUPPORT OF APPEAL FROM THE PRIMARY EXAMINER TO THE BOARD OF APPEALS

Sir:

This is an appeal of a Final Rejection under 35 U.S.C. §103(a) of claims 1-8, and 13-24 of Application Serial No. 09/893,222, filed June 27, 2001. This Brief is submitted pursuant to a Notice of Appeal filed December 17, 2004, as required by 37 C.F.R. 1.192.

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### 1. Real Party in Interest

International Business Machines Corporation is the real party in interest; inventors assigned their interest as recorded on August 31, 2001, on Reel 012148, Frame 0968.

### 2. Related Appeals and Interferences

There are no related appeals or interferences pending with this application.

## 3. Status of Claims

Claims 1-8 and 13-24 are pending and stand finally rejected. Claims 9-12 were objected to as containing allowable subject matter, but were dependent on non-allowed claims.

Claims 1, 2, 4, 6, 17-20, and 23 are finally rejected under 35 U.S.C. §102(b) as being anticipated by Reisenfeld (US Patent No. 4887280). Claims 3 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280). Claims 5 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Gabara (US Patent No. 6307443). Claims 7, 8, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Torgow et al. ("Bandpass Filters with Steep Skirt Selectivity"; Torgow et al.; PTGMTT International Symposium Digest, 1964, Vol. 64, Issue 1, May 1964, Pages 22-26). Claims 13-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronson et al. (US published patent application no. 09/777917) in view of Reisenfeld (US Patent No. 4887280), and further in view of Doh et al. (US Patent No. 6684033).

## 4. Status of Amendments

No amendments have been entered.

## 5. Summary of Invention

The invention relates to the field of optical receivers and transceivers capable of operating at multiple data rates, and, preferably, having autonegotiation capabilities.

Standards are developing for allowing higher speed optical transceiver users to inter-operate with lower speed transceivers. Therefore, future optical transceivers would be capable of operating at different speeds. Thus, there is a need to determine

when the transceivers' bandwidths are modified. Towards this end, the present invention relates to a fully self-contained data rate detector that allows selection of the data rate of an incoming signal without an external control signal or complicated clock-recovery schemes.

In accordance with the invention (Figs. 1-3) electrical signals 122, 124 are input to a data rate detection circuit 140. The data rate detection circuit 140 detects the rate of transmission of the optical data input 114 and provides a signal output 138 to a host 200, and possibly the optical receiver 120 and the post amplifier 130. In response to the signal output 138 indicating the incoming data rate, the host 200 may thereby adjust the data rates at which it tries to receive and send data.

The data rate detector 140 comprises an input interface device, such as buffer and/or gain stage 220, a passing frequency-selective filter assembly 221 that comprises in one embodiment 1 to "n" passing frequency-selective filters 222a, 222b, 222n, such as a bandpass filter, a signal detector 224, and may also include a clock reference unit 226. The clock reference unit 226 is active when the filter is operating on digital signals in the z-domain. Inputs to the buffer and gain stage 220 are a true and complement of the output signal voltage signals 122, 124. The buffer/gain stage 220 serves two purposes: first, it isolates the filter assembly 221 from the post amplifier 130, and second, it enlarges the signals 122, 124 for easier detection. The buffer/gain stage 220, however, need not receive two signals; it may only receive one signal. Each one of the bandpass filters then receives the output of the buffer/gain stage 220 in either a true and complement configuration or a single signal configuration. Each of the bandpass filters inhibits all frequencies, but the one for which each is designed, as will be discussed and outputs the true and complement 232, 234 (or single signal) from each to a signal detector 224. Hence, for example, with two filters in the filter assembly, the present invention can detect three signals with respectively different known data rates. Each bandpass filter would use a corresponding signal detector (not shown).

Each of the bandpass filters inhibits all frequencies, but the one for which each is designed, as will be discussed and outputs the true and complement 232, 234 (or single signal) from each to a signal detector 224.

When the fundamental data rate is present, the first null in the frequency spectrum is at the fundamental data rate and at each integer multiple (harmonic) of the fundamental data rate, *see e.g.*, the nulls at 1, 2, 3, and 4 on the graph of Figure 3. It follows then, that a data rate of twice the fundamental data rate would have a first null corresponding to twice the fundamental data rate. As seen in Figure 3, when the fundamental data rate reaches its first null, a data rate that is twice as fast still has a large spectral power difference. In fact, the largest difference in spectral power between the two frequencies occurs at the fundamental data rate.

## 6. Issues

**I -- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 1, 2, 4, 6, 17-20, and 23 are finally rejected under 35 U.S.C. §102(b) as being anticipated by Reisenfeld (US Patent No. 4887280)?**

**II-- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 3 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280)?**

**III-- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 5 and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Gabara (US Patent No. 6307443)?**

**IV-- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 7, 8, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Torgow**

et al. ("Bandpass Filters with Steep Skirt Selectivity"; Torgow et al.; PTGMTT International Symposium Digest, 1964, Vol. 64, Issue 1, May 1964, Pages 22-26)?

V--- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 13-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Aronson et al. (US published patent application no. 09/777917) in view of Reisenfeld (US Patent No. 4887280), and further in view of Doh et al. (US Patent No. 6684033)?

## 7. Grouping of Claims

Claims 1-3, 5, 13-18, 21, and 24 stand alone. Claims 4, 6-8, 22 and 23 stand with their respective independent claims 1 and 17. Claims 19 and 20 stand with claim 18.

## 8. Arguments

Issue I--- Does the evidence relied upon support the rejection of Claims 1, 2, 4, 6, 17-20, and 23 under 35 U.S.C. §102(b) as being anticipated by Reisenfeld (US Patent No. 4887280)?

Appellants respectfully traverse the above grounds of rejection. Claim 1 contains subject matter not anticipated by Reisenfeld.

Claim 1 recites and the Reisenfeld reference does not teach:

A data rate detector, comprising:

an input interface to receive a digital signal having a data rate that is one of at least two known data rates;

a passing frequency-selective filter assembly coupled to the input interface and includes a first filter to pass a signal when at least a selected difference of spectral power at a first selected filtered frequency exists between the one known data rate of the signal relative to the other of the two known data rates of the filter; and,

a signal detector coupled to the filter to detect the passed signal and output a data rate signal related thereto.

Reisenfeld is directed to data rate detector, but does not teach or suggest the claimed "input interface to receive a digital signal having a data rate that is one of at lease two known data rates." Moreover, Reisenfeld does teach or suggest the claimed "passing frequency-selective filter assembly" coupled to the input to pass a signal "when at least a selected difference of spectral power at a first selected filtered frequency exists between the known data rate of the signal relative to the other of the two known rates".

Reisenfeld is directed to detecting the presence of a data signal and determining if the received signal is within one of N known, data rate ranges. Reisenfeld requires inphase and quadrature data bits that are modulated onto the received signal S(t). I' and Q' baseband components are provided by the carrier recovery loop 12 and quadrature mixers and low pass filters 13. In the quadrature mixer and bandpass filter circuit 13, the coherent carriers are mixed with the received signal S(t)by mixers 23 and 24 and low pass filters 26 and 28 to obtain I' and Q' baseband components. Thus, the comparator 46 compares the power associated with the low passed representation of the I' and Q' signals to the power associated with the bandpassed representation of the same signals.

The Examiner has relied upon a symbol timing loop 64 to anticipate the claimed "input interface". Specifically, the Examiner has relied col. 5, lines 4-26 and col. 1, lines 45-48, and col. 4, lines 3-9 for supporting his contention that the symbol timing loop 64 meets the claimed "input interface". Symbol timing loop 64 is not the claimed "input interface". In contrast, "symbol timing loop" 64 includes dual differentiators 76 and 78. The squaring circuits 80 and 82 of the timing loop 64 transform the negative pulses from the differentiators 76 and 78 of the timing loop 64 to positive pulses. The summing circuit 84 of the timing loop 64 sums signals representing both the I' and Q' inputs to generate the strongest frequency component at the symbol rate."

The claimed "input interface" of claim 1 does not require the inphase and quadrature data bits for subsequent analyses of the data rate of the receive signal S(t). Symbol timing loop (element) 64 does not function to receive the signal of "one of two known data rates". The symbol timing loop is for use with inphase I' and quadrature Q' components of the same signals.

Beyond this difference, the Examiner has read Reisenfeld's second channel 32 (element) ( col. 4, lines 10-40) as the so-called claimed "passing frequency-selective filter assembly". However, Reisenfeld's second channel 32 is a second channel input to the comparator 46. The second channel 32 includes first and second bandpass filters 48 and 50, respectively. The first bandpass filter 48 operates on the I' component and the second bandpass filter 50 operates on the Q' component of the received signal in he second channel.

The power of each component in the passband of the bandpass filters 48 and 50 is measured by a second set of squaring circuits 52 and 54 and a circuit 56, which provides the square root of the sum of the squares of the baseband signals. A low pass filter 58 is provided to improve the signal-to-noise ratio of the second channel at the decision point. The output of the filter 58 is scaled by an amplifier 60 and provided as a second input to the analog comparator 46.

The comparator 46 compares the power associated with the low passed representations of the I' and Q' signals to the power associated with the bandpassed representations of the same signals.

The second channel 32 does not function to behave as "a passing frequency-selective filter assembly coupled to the input interface and includes a first filter to pass a signal when at least a selected difference of spectral power at a first selected filtered frequency exists between the one known data rate of the signal relative to the other of the two known data rates of the filter".

Accordingly, there is no anticipation within the meaning of 35 USC 102.

Moreover, it would be hindsight to suggest that such differences that exist between the claimed invention and Reisenfeld are obvious given the absence of any suggestion or motivation by Reisenfeld to modify its own construction to perform functions it does not teach or suggest.

It is respectfully submitted that for the reasons expressed above, the rejection should be withdrawn because it does not meet the requirements of 35 USC 102 and would not meet the requirements of 35 USC 103.

Hence, independent claim 1 is patentable. The final rejection thereof should be withdrawn.

Not only is claim 1 patentable but also so are all of its dependent claims. Dependent claims 4 and 6 stand with claim 1.

Dependent claim 2 stands alone:

The data rate detector of claim 1, wherein the preselected spectral power difference is the difference between the spectral power values of one of the two known data rates compared to a corresponding spectral power value of a null of the other of the two data rates at the preselected filtered frequency.

The Examiner relies upon the material in col. 4 , lines 10 -40 to anticipate the claimed invention. Anticipation fails for the reasons noted above concerning claim 1. The foregoing passage discusses the relative positioning of the nulls and does not expressly teach preselected spectral power difference is the difference between the spectral powers values of one of the two known data rates compared to a corresponding spectral power value of a null of the other of the two data rates at the preselected filtered frequency.

Hence, dependent claim 2 is patentable and the final rejection thereof should be withdrawn.

Claim 17

This is a method claim similar to claim 1 discussed above. For similar reasons, the Reisenfeld patent does not anticipate the claimed process. Hence, claim 17 is patentable and the final rejection should be withdrawn. Not only is claim 17 patentable but so are all of its dependent claims. Dependent claims 19, 20 and 23 are patentable and stand with claim 1.

Claim 18

Claim 18 depends on claim 17. Claim 18 is therefore patentable. Also, claim 18 is similar to claim 2 and is patentable for the reasons set forth above in regard to claim 2.

Claims 19 and 20

These claims depend from and stand with claim 18.

**Issue II--- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 3 and 24 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280)?**

Claims 3 and 24 stand with claims 1 and 17; respectively, and each is separately patentable, since it would be hindsight to suggest that the differences which exist between the claimed invention and Reisenfeld are obvious given the absence of any suggestion or motivation by Reisenfeld to modify its own construction to perform

functions it does not teach or suggest. The second channel is for use by the comparator 46.

The comparator 46 compares low passed representations of the I' and Q' signals of channel 32 to the power associated with the bandpassed representations of the same signal from channel 30. It is not seen how Reisenfeld would be modified to compare different signals without dramatically changing Reisenfeld. Accordingly, there is inadequate motivation to suggest two known data rates are integer multiples of each other in Reisenfeld.

**Issue III--- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 5 and 21 under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Gabara (US Patent No. 6307443)?**

Claim 5

This claim calls for the first filter being a tunable filter that includes logic to pass multiple rates by adjusting the first null of the one known data rate.

Claims 5 and 21 stand with claims 1 and 17; respectively, but are separately patentable. Claim 17 includes subject matter similar to claim 5. The Examiner makes the proposal that Gabara's tunable filter could be obviously used in Reisenfeld. Appellants take the position that it is entirely conjecture on part of the Examiner to suggest that Gabara teaches adjusting the first null of the unknown data rate in the channel 32. Channel 32 has nothing to do with adjusting the first null. Nor is it obvious any one would want to do so.

Such proposal would go against the direct teachings of the Reisenfeld patent. It is not obvious to modify a primary or base reference by a secondary reference when it is clear such modification goes against the express teachings of the base reference.

The Examiner's motivation in this instance is clearly based on the hindsight gathered from reading Appellant's disclosure.

Hence, claim 5 is patentable and the final rejection should be withdrawn. Since claim 21 is similar to claim 5 it too is patentable and the final rejection should be withdrawn.

**Issue IV--- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 7, 8, and 22 under 35 U.S.C. §103(a) as being unpatentable over Reisenfeld (US Patent No. 4887280) in view of Torgow et al. ("Bandpass Filters with Steep Skirt Selectivity"; Torgow et al.; PTGMTT International Symposium Digest, 1964, Vol. 64, Issue 1, May 1964, Pages 22-26)?**

Claims 7, 8, and 22 stand with their respective independent claims.

**Issue V--- Does the evidence relied upon and the level of ordinary skill in the art support the rejection of Claims 13-16 under 35 U.S.C. §103(a) as being unpatentable over Aronson et al. (US published patent application no. 09/777917) in view of Reisenfeld (US Patent No. 4887280), and further in view of Doh et al. (US Patent No. 6684033)?**

Claim 13 is directed to an optical transceiver.

13. An optical transceiver, comprising:

(a) an optical receiver having a photodetector to receive an optical input and a transimpedance amplifier to generate an output electrical signal in response thereto;

(b) a frequency-selective filter assembly coupled to the input interface and includes a first filter to pass a signal when at least a selected difference of spectral power at a first selected filtered frequency exists between one known data rate relative to the other of two known data rates; and,

a signal detector coupled to the filter to detect the passed signal and output a data rate signal related thereto;

(c) a post amplifier connected to the signal rate detector and the optical receiver;

(d) a host interface connected to couple outputs of the signal rate detector and the post amplifier to a host system and in response to the output of the signal rate detector, the optical receiver and/or the transimpedance amplifier and/or the post amplifier and/or the host adapt to a rate of transmission of the optical input.

The Examiner has rejected the claim on the grounds that Aronson can be modified based on the Reisenfeld patent. However, it is respectfully submitted that the Examiner has indulged in impermissible hindsight to combine these references to reject the claim.

Aronson deals with an integrated memory controller circuit for fiber optics in a transceiver. The Examiner recognizes that Aronson does not teach a data rate detector of the claimed type. Moreover, , Reisenfeld does not teach the claimed data rate detector, let alone would suggest it being obvious to place in an optical transceiver. In addition, neither the Aronson nor Reisenfeld patents provide motivations for their combination together. Reisenfeld's data rate detector could not be used in optical transceiver. Moreover, there is not any suggestion by Reisenfeld that his system could be used in an optical transceiver. Moreover, Reisenfeld's method of using I' (inphase) and Q' (quadraphase) components and measuring them would not appear to be operable in the Aronson optical system.

Moreover, the Examiner further relies upon Doh to cover the shortcoming of the Reisenfeld and Aronson combination. Doh was cited because of Reisenfeld and Aronson's failure to disclose a low noise transimpedance amplifier in the claimed combination. Doh does not overcome the shortcomings of Aronson and Reisenfeld as noted earlier. Doh was merely cited because it discloses an optical receiver with a photodiode followed by a low noise transimpedance amplifier. At this point Doh is not concerned with solving the issues of the present invention. The Examiner does not explain how why Doh's structure could be used in the Reisenfeld data rate detector.

Accordingly, claim 13 is patentable and the final rejection thereof should be withdrawn. The claims 14-16 stand with claim 13, but also each is separately patentable, and the final rejections thereof should be withdrawn.

Claims 14-16 call for:

14. The optical transceiver of claim 13, further comprising:

(a) an ac modulator to receive host input through the host interface and generate an electrical output; and

(b) an optical transmitter to receive the electrical output of the ac modulator and in response thereto generate an optical output.

15. The optical transceiver of claim 14, wherein the optical output is at the rate of transmission of the optical input.

16. The optical transceiver of claim 14, wherein the optical transmitter is a laser.

In terms of each of the above claims, the Doh patent does not cure the deficiencies of the combination of Aronson and Reisenfeld noted above.

Moreover, Doh does not provide sufficient motivation for modifying Aronson and Reisenfeld to include Doh's structure and function as proposed by the Examiner. While Doh provides for a bit rate detection circuit, such circuit detects data rate bits for adjusting the frequency of the VCO of the receiver. Reisenfeld is not related to optical transceivers. Aronson is solving a different problem relating to controlling memory in an optical transceiver so as to control the functions of the laser transmitter. The present invention is not limited to adjusting the frequency of the VCO. Each of the different references applied provide solve different problems in manners different from the present invention and indeed different from each other. There is no suggestion other than from Applicants' invention.

It is respectfully submitted that each of the claims 14-16 are patentable. Therefore, the final rejections should be withdrawn.

## 9. Summary

The Examiner has resorted to impermissible hindsight to combine the teachings of the prior art since the latter neither singly nor in combination provide the requisite suggestions or motivations for the combinations proposed by the Examiner under 35 U.S.C. 103(a). The Examiner has taken phrases and portions out of context and has used Appellants' disclosure as a template in order to reject the appealed claims.

For all the reasons advanced above, it is respectfully submitted that the decision of the Examiner in finally rejecting the claims should be reversed.

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_______February 28, 2005___
(Date of Deposit)

Nancy J. Larson

Nancy J. Larson

Respectfully submitted,

By: Leslie J. Payne

Leslie J. Payne, Attorney
Attorney Reg. No.: 26,378
IBM Corporation, Dept 917
3605 Highway 52 North
Rochester, MN 55901-7829
Telephone: (507) 253-2555

## APPENDIX

1. (Original) A data rate detector, comprising:

an input interface to receive a digital signal having a data rate that is one of at least two known data rates;

a passing frequency-selective filter assembly coupled to the input interface and includes a first filter to pass a signal when at least a selected difference of spectral power at a first selected filtered frequency exists between the one known data rate of the signal relative to the other of the two known data rates of the filter; and,

a signal detector coupled to the filter to detect the passed signal and output a data rate signal related thereto.

2. (Original) The data rate detector of claim 1, wherein the preselected spectral power difference is the difference between the spectral power value of one of the two known data rates compared to a corresponding spectral power value of a null of the other of the two data rates at the preselected filtered frequency.

3. (Original) The data rate detector of claim 1, wherein the two known data rates are integer multiples of each other.

4. (Original) The data rate detector of claim 1, wherein the filter assembly includes at least a second filter coupled to the input interface to receive a digital signal having a data rate that is at a third known data rate, the second filter passes a signal when at least a selected difference of spectral power at a second selected filtered frequency exists between the third known data rate and the two known data rates, and a second signal detector detects the passed signal of the second filter and outputs a corresponding data rate signal related thereto.

5. (Original) The data rate detector of claim 1 wherein the first filter includes a tunable filter that includes logic to pass multiple rates by adjusting the first null of the one known data rate.

6. (Original) The data rate detector of claim 1 wherein the first filter is a bandpass filter.

7. (Original) The data rate detector of claim 6, wherein the bandpass filter is a passive filter.

8. (Original) The data rate detector of claim 7, wherein the passive filter is a Butterworth filter.

9. (Original) The data rate detector of claim 1, wherein the first filter includes a reference clock coupled thereto.

10. (Previously Presented) The data rate detector of claim 9, wherein the first filter is a tunable filter that is operable for adjusting a first null of the one known data rate at the selected filtered frequency.

11. (Original) The data rate detector of claim 9, wherein the first filter is an active filter.

12. (Previously Presented) The data rate detector of claim 12, wherein the active filter comprises a DSP filter.

13. (Original) An optical transceiver, comprising:

(a) an optical receiver having a photodetector to receive an optical input and a transimpedance amplifier to generate an output electrical signal in response thereto;

(b) a frequency-selective filter assembly coupled to the input interface and includes a first filter to pass a signal when at least a selected difference of spectral power at a first selected filtered frequency exists between one known data rate relative to the other of two known data rates; and,

a signal detector coupled to the filter to detect the passed signal and output a data rate signal related thereto;

(c) a post amplifier connected to the signal rate detector and the optical receiver;

(d) a host interface connected to couple outputs of the signal rate detector and the post amplifier to a host system and in response to the output of the signal rate detector, the optical receiver and/or the transimpedance amplifier and/or the post amplifier and/or the host adapt to a rate of transmission of the optical input.

14. (Original) The optical transceiver of claim 13, further comprising:

(a) an ac modulator to receive host input through the host interface and generate an electrical output; and

(b) an optical transmitter to receive the electrical output of the ac modulator and in response thereto generate an optical output.

15. (Original) The optical transceiver of claim 14, wherein the optical output is at the rate of transmission of the optical input.

16. (Original) The optical transceiver of claim 14, wherein the optical transmitter is a laser.

17. (Original) A method of detecting the transmission rate of a data signal, comprising:

(a) receiving the data signal having the transmission rate that could be one of at least two known data rates;

(b) utilizing a frequency-selective filter assembly including a first filter for passing signal if the incoming data rate exists at the preselected filtered frequency and comparing the signal power to the selected spectral power level; and,

(c) passing an output from the filter to a signal detector and outputting a data rate signal from the signal detector.

18. (Original) The method of claim 17, wherein the preselected difference is the difference in spectral power between a null of the data signal at one of the two known data rates compared to a corresponding spectral power value at the other of the two known data rates.

19. (Original) The method of claim 18, wherein the data rate signal has a voltage indicative of the transmission rate.

20. (Original) The method of claim 19 wherein the filtering is accomplished by using a bandpass filter.

21. (Original) The method of claim 19 wherein the bandpass filtering step is accomplished by an active filter.

22. (Previously Presented) The method of claim 17, wherein the filtering step is accomplished by a passive filter.

23. (Original) The method of claim 17 wherein provision is made for at least a second filter coupled to the input interface to receive a digital signal having a data rate that is at a third known data rate, the second filter passes a signal when at least a selected difference of spectral power at a second selected filtered frequency exists between the third known data rate and the two known data rates, and a second signal detector detects the passed signal of the second filter and outputs a corresponding data rate signal related thereto.

24. (Original) A data rate detector, comprising:

an input interface to receive a signal having a data rate that is one of at least two known data rates;

a frequency-selective filter assembly including at least a first filter coupled to the input interface to pass a signal at one of the two known data rates when at least a

preselected difference of spectral power at a preselected filtered frequency of the one known data rate exists relative to a signal having the other of the two known data rates;

a signal detector to detect the passed frequency and output a data rate signal;

at least one feedback path to the input interface to adapt to the passed frequency to optimize transmission in response to the data rate signal; and,

a host interface to transmit the data rate signal outside the data rate detector.